

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Cancelled).
2. (Cancelled).
3. (Cancelled).
4. (Currently amended) A process as claimed in claim 1 in step (e) according to claim 13, wherein the small lumps formed in step (d) are cooled to a temperature from 40° [-] to 50°C.
5. (Currently amended) A process as claimed in claim 1 in step (d) according to claim 13, wherein the outlet material from cooler is slaked in water to obtain slurry in the concentration range of 15 to 23% by weight with step (f) comprises continuous agitation for up to one hour at maximum 120 RPM to convert calcium oxide to calcium hydroxide.
6. (Currently amended) A process as claimed in claim 1 in step (f) according to claim 13, wherein the said slaked lime slurry is subjected to carbonation, bypassing there through sufficient quantity of a gas comprising carbon dioxide – air mixture in step (i) comprises 25% carbon dioxide in air to adjust the pH of the suspension to mere neutral, in a and the carbonation reactor is provided with a purger.
7. (Currently amended) A process as claimed in claim 1 in step (f) according to claim 13, wherein the slurry in the carbonation reactor is maintained at a temperature of carbonation is preferably in the range of from 30 to 45°C until the pH of the slurry becomes neutral.

8. (Cancelled)

9. (Currently amended) A process ~~as claimed in claim 1 in step (g)~~ according to claim 13, wherein the precipitated ~~product~~material is ~~separated~~separated in step (k) preferably by filtration or centrifugation.

10. (Cancelled)

11. (Currently amended) A process ~~as claimed in claim 1 in step (i)~~ according to claim 13, further comprising prior to step (k), the step of: ~~wherein treating the slurry of the product is optionally treated with an emulsion of fatty acid derivative for coating to obtain a product having industrial applications~~slurry of coated calcium carbonate.

12. (Cancelled).

13. (New) A process for the production of precipitated calcium carbonate from a calcium carbonate-rich by-product of an industrial processes, the claimed process comprising:

(a) continuously feeding a wet calcium carbonate-rich by-product into a calciner to generate calcined material;  
wherein the calcium carbonate-rich by-product:  
contains up to 25% moisture,  
has a particle size from 20 to 150 microns, and  
is fed to the calciner at a feed rate from about 5 to 20 kg/h; and  
wherein the calciner  
is maintained at a temperature from 850° C to 950° C,  
has an angle of inclination of about 1.08 degrees, and  
has a shell rotation speed from 0.5 to 2.0 RPM;

(b) routing water vapor, carbon dioxide, ammonia and NO<sub>x</sub> gas liberated from the calcium carbonate-rich by-product in the calciner to a scrubber, wherein ammonia and NO<sub>x</sub> gasses are scrubbed with water;

- (c) after a residence time in the calciner from 30 to 90 minutes, outputting the calcined material at a rate from 2.0 to 10.0 kg/hour to a crusher;
- (d) crushing the calcined material into small lumps using said crusher;
- (e) cooling the small lumps to near ambient temperature in a cooler;
- (f) slaking the cooled lumps with water in a slaker provided with an agitator rotating at a maximum speed of 120 RPM to produce a hydrated lime slurry having a solids content from 15 to 23% by weight;
- (g) removing heavy particles from the hydrated lime slurry by sedimentation, by wet sieving through a 60 to 100 mesh sieve, or by both sedimentation and wet sieving;
- (h) diluting the slurry with water to a solids content in the range from 10 to 20% by weight;
- (i) feeding the diluted slurry to a carbonation reactor and subjecting the slurry to a carbonation reaction wherein a carbon dioxide – air mixture containing from 25 to 75% by volume carbon dioxide is passed through the slurry at a superficial gas velocity from 10 to 15 cm/sec;
- (j) maintaining the slurry in the carbonation reactor at a temperature in the range from 25 to 45° C until the pH of the slurry becomes neutral;
- (k) separating solids precipitated from the carbonation reaction; and
- (l) drying and pulverizing the separated solids to obtain precipitated calcium carbonate having a purity of greater than 97%, a brightness of greater than 96%, a bulk density of 0.40 to 0.65 g/mL and an average particle size of about 5 to 20 microns, wherein 100% of the particles are less than 20 microns.